Agence spatiale canadienne | Canadian Space Agency

Canada

Earth Observation Express

Other Editions

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1. Exercising Sovereignty Over Canada's North: Arctic Shipping Routes Open

As sea ice melts during the summer months, two major shipping routes have opened in the Arctic Ocean. Every year, the Arctic Ocean experiences the formation and then melting of vast amounts of floating ice, but the rate of overall loss has accelerated. This animation shows the melting of Arctic sea ice from 1 June to 24 August 2011: www.esa.int/images/JunAug_ArcticIceCoverAnim_H.gif. This animation consists of Envisat ASAR mosaics of the Arctic Ocean acquired in mid-August 2011: www.esa.int/images/ASAR_2010-11_Arctic_H.gif. Located in the Canadian Arctic Archipelago, the Northwest Passage can be a shipping short cut between Europe and Asia: www.esa.int/images/2011-08-24_NorthwestPassageCanada_H.jpg. The Canadian Space Agency (CSA) contributed to the development of Envisat.

2. RADARSAT-2 Data Contributes to a New Understanding of Antarctic Terrain

Imagery acquired from the Canadian satellite RADARSAT-2 has enabled the landmark discoveries announced on August 18th by University of California (UCI) researchers. Previously unmapped glaciers of Antarctica have been charted by accessing imagery collected from Canadian, European and Japanese Earth Observation (EO) satellites. Using NASA technology, the researchers have discovered unique terrain features that indicate the direction and velocity of ice in Antarctica. This will provide invaluable insight into ice melt and future sea rise due to climate change. The full continental coverage of Antarctica was made possible due to the unique capabilities of RADARSAT-2 to image left and capture data and information over the central part of the continent. This endeavor was coordinated by the International Polar Year (IPY) Space Task Group and was only possible through the collective effort of the Synthetic Aperture Radar (SAR) mission Coordination Group. International contributors include the CSA, NASA, the European Space Agency (ESA) and the Japanese Aerospace Exploration Agency. To read the press release, please visit www.asc-csa.gc.ca/eng/media/news_releases/2011/0818.asp. To view the animations showing the motion of ice in Antarctica as measured by satellite EO data from the CSA, the Japanese Space Agency and ESA, and processed by NASA-funded research from the UCI, please visit:

www.nasa.gov/multimedia/videogallery/index.html?media_id=106877491.

3. Upcoming Opportunity: Science and Operational Applications Research – Education International (SOAR-EI)

The Canadian Space Agency (CSA), in partnership with MacDonald Dettwiler and Associates Ltd. - MDA Geospatial Services Inc., is implementing the SOAR-EI initiative. This initiative, under the umbrella of the SOAR program, is intended for researchers in the international education community. In the proposal, the Principal Investigator must demonstrate interest and ability in terms of transforming RADARSAT-2 Products that would lead to a useful informative value added product. The announcement of opportunity, planned for Fall 2011, will be open for a limited two month-period. For more information, contact stephane.chalifoux@asc-csa.gc.ca or bjefferies@mdacorporation.com. IMPORTANT: The SOAR-EI opportunity will be announced through the CSA EO-Express newsletter. To subscribe, please send an email to eo-express@asc-csa.gc.ca or visit www.asc-csa.gc.ca/eng/newsletters/eo_express/editions.asp. Please note that Canadian Researcher, are invited to submit their proposal to SOAR-education. For more information about the SOAR Program, please visit: www.asc-csa.gc.ca/eng/programs/soar/default.asp.

4. Disaster Management Earth Observation Applications: RFSO for RIPS Now Closed

Canada has identified disaster management as one of three key applications domain for the upcoming RADARSAT Constellation Mission (RCM). The Canadian Space Agency (CSA) Request For Standing Offer (RFSO) for the Provision of Earth Observation (EO) based Rapid Information Products and Services (RIPS) regarding disaster response and environmental emergency management has closed on August 26th 2011. The purpose of this RFSO Request for Standing Offer (RFSO) is to make available to the Canadian Space Agency (CSA) and its partners fours standing offers of qualified list of Canadian suppliers that can provide EO-based RIPS to meet the needs of disaster management authorities, when required. These products and services will be used to demonstrate EO capability to support disaster management initiatives. The information will be made available to potential end-users within federal government departments and agencies and those organizations requesting support, for example the Committee on Earth Observation Satellites (CEOS), the Group of Earth Observation (GEO). For more information about the RIPS initiative, please contact guy.aube@asc-csa.gc.ca.

5. Caribbean Satellite Disaster Pilot: Hurricane Season 2011

As the 2011 Atlantic hurricane season reaches its peak, the Canadian Space Agency (CSA) Earth Observation Applications and Utilization (EOAU) Division continues to support disaster management for affected populations across the Caribbean, including local damage assessment and coastal change detection. CSA is a critical part of the NASA-led Caribbean Satellite Disaster Pilot (CSDP), contributing more than 40 high-resolution RADARSAT-2 scenes have been collected by CSA in preparation for rapid change detection and flood mapping activities. In addition, CSA is leading the CSDP's efforts for longer-term risk mitigation and preparedness, working directly with local authorities in five Caribbean island states. In the coming months, radar imagery will be planned and acquired over affected areas to assist disaster management efforts. The data sets are accessible to accredited CSDP end-users within a very short time. In cooperation with Canadian industry and Caribbean authorities, CSA will also

contribute EO expertise and RADARSAT-2 image change detection maps for local damage assessment teams. Canada's contributions are part of the overall GEO Task 'Demonstrating regional end-to-end applications for disaster management which is led by CSA on behalf of the Committee on Earth Observation Satellites (CEOS). For further information, please contact guy.seguin@asc-csa.gc.ca or guy.aube@asc-csa.gc.ca.

6. Ocean Ecosystem Productivity: Arctic Phytoplankton Summer Bloom Monitored With Canadian Earth Observation Technology

Monitoring the interactions between the oceans and climate with Earth Observation (EO) satellites provide information on basic productivity of the oceans and how this productivity provides food for fish. It also helps to report on indicators of the health of the ocean ecosystem, its stability and fragility in the face of anthropogenic and natural changes. Cape Nordkinn is the northern point on Nordkinn Peninsula (Barrents Sea) in Norway. The southern area of this deep shelf sea remains mostly ice-free due to the warm North Atlantic Drift. This contributes to its high biological production compared to other oceans of similar latitude. Phytoplanktons are able to convert inorganic compounds such as water, nitrogen and carbon into complex organic materials. With their ability to 'digest' these compounds, they are credited with removing as much carbon dioxide from the atmosphere as their 'cousins' on land - therefore having a profound influence on climate. They are also sensitive to environmental changes, so it is important to monitor and model phytoplankton into calculations of future climate change. To view a phytoplankton bloom captured recently by MODIS (Aqua) on August 14th and by Envisat MERIS on August 17th near Cape Nordkinn, please visit: eoimages.gsfc.nasa.gov/images/imagerecords/51000/51765/BarentsSea_amo_2011226_lrg.jpg, esamultimedia.esa.int/images/imageoftheweek/2011-08-24_AlgaeBloomBarentsSea_H1.jpg. The Canadian Space Agency (CSA) contributed to the development of Envisat.

7. Precision Farming: Nitrogen Requirement Assessment Through Crop Earth Observation

Through the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), Agriculture and Agri-Food Canada (AAFC) is developing a precision farming project titled "N Watch: Nitrogen Requirement Assessment Through Crop Observation". The ultimate objectives are to make fertilizer management decisions on a regional as well as subfield bases and to improve Canadian farmers' profit and harvest yields while reducing the negative impacts of farming on the environment (water pollution, soil degradation and greenhouse gases emissions). More specifically, this AAFC/GRIP project is to establish the EO data sources and processing steps to include (pas certaine de ce que tu veux dire) in the information product, to quantify and to qualify the degree of accuracy achieved by the information products in a context of relative, instead of absolute, crop growth assessment. It will also examine the possible integration of the information products into Agri-Environment Services Branch (AESB) operations. The project team will use multiple sets of EO data, including RADARSAT-2, WorldView-2, Rapid-Eye, SPOT-5, GeoEye-1, QuickBird and Ikonos. The future RADARSAT and Sentinels constellations are envisioned for N Watch operations. This GRIP project fits in the Government of Canada national priority areas of the AAFC Science and Innovation Strategy (i.e. Enhancing environmental performance of the Canadian agricultural system). It has the potential to affect how N fertilizer inputs are managed by farmers and regulated by federal and provincial governments. For more information, please contact Nicolas.Tremblay@AGR.GC.CA and guy.aube@asc-csa.gc.ca.

8. Precision Agriculture: Mapping Soil Drainage Indicators Using RADARSAT-2

Agricultural parcels are made up of soils with different properties and behaviours in terms of productivity potential, development needs and risks for degradation or losses to the environment. Precision agriculture uses a number of technologies, including earth observation (EO), to manage soil variability within parcels by adjusting the application rates of inputs (fertilizer, lime, pesticides, etc.) or development work (irrigation, drainage, sowing, etc.) to the specific soil conditions. In partnership with the Canadian Space Agency (CSA) Government Related Initiatives Program (GRIP), Agriculture and Agri-Food Canada (AAFC) uses RADARSAT-1 and RADARSAT-2 images, as well as optical images, to generate maps of drainage and soil surface texture in the Montérégie region on both the local (farm) and regional (watershed) levels. These raster maps (30 m x 30 m) provide more precise information on the spatial variability of the surface texture class and the soil drainage than vector maps from conventional soil mapping. The project under way, entitled "Soil Property Retrieval Using Multi-Temporal SAR and Expert Knowledge," is directly linked to the Government of Canada's Growing Forward strategic framework and to the GlobalSoilMap.net and GEOSS initiatives. For more information, please contact michel.nolin@agr.gc.ca and guy.aube@asc-csa.gc.ca.

9. Precision Farming: Giving Eyes to Crop Models

Through the Canadian Space Agency's (CSA) Government Related Initiatives Program (GRIP), Agriculture and Agri-Food Canada (AAFC) is developing a project titled "Adapting cropping systems to climate variations: deriving crop biomass and yield from remote sensing over a region: demonstration and planning phase in eastern Ontario". When it comes to predicting yield and estimating the ecological footprint of crops over a region, crop growth models can be used in conjunction with soil and climate databases. These databases are not capturing all the spatial variations of importance for crop growth. For example, within-field heterogeneous soil properties, rainfall distribution in tens-km radius of a weather station are not fully captured while they influence crop growth. Moreover, detailed management practices (e.g. crop type, seedbed preparation, seeding date, fertilization, weed management, harvest) are unknown, unless individual farmers are interviewed. By using biophysical descriptors derived from multi-temporal Earth Observation (EO), such as leaf area index (LAI)over the growing season (2-6 images), key input parameters of crop models can be optimized. The re-initialization of these input model parameters compensates to some extent for the lack of spatial information. Using field subunits defined by field boundaries and soil texture maps for running the crop model, they showed that yield and biomass could be predicted with great accuracy as well as water consumption. The study showed the importance of having access to basic daily climatic data spatially representative of the region of interest to run the crop growth model. Getting better meteorological information from satellite will greatly enhance crop model predictions. For more information, please contact elizabeth.pattey@AGR.GC.CA and guy.aube@asc-csa.gc.ca.

10. Horn of Africa Drought Monitoring: Earth Observation Applications with SMOS

Drought in Somalia, Kenya, Ethiopia and Djibouti is pushing tens of thousands of people from their homes as millions face food insecurity in a crisis visible from space. The Soil Moisture and Ocean Salinity (SMOS) Earth Observation

(EO) satellite shows that the region's soil is too dry to grow crops. The SMOS data shows that Somalia's soil appears dry during the 2011 main rainy season, particularly in the southern agricultural region. The animation, derived from SMOS satellite data, shows soil moisture in the Horn of Africa from April to mid-July 2011. The orange and yellow colouring depicts little to no moisture, while green and blue depict higher levels of soil moisture: download.esa.int/multimedia/earthobservation/smos_somalia_anv2.gif. Canada contributed to the development of SMOS. Array Systems Computing Inc. (Toronto, Canada) in collaboration with the Expert Support Labs (ESL), ESA and the Canadian Space Agency, has successfully developed the SMOS Level 2 Soil Moisture processor.

11. MDA to provide RADARSAT-2 imagery to support ESA's GMES program

MacDonald, Dettwiler and Associates Ltd. (MDA) announced on August 10th ,2011 the signature of a a contract over CA$11 million to provide RADARSAT-2 satellite imagery to the European Space Agency (ESA). The imagery will be delivered from June 2011 until May 2014. The RADARSAT-2 imagery will be used to provide mission critical information for sea ice monitoring of the Baltic Sea and Arctic Ocean throughout the ice seasons; support disaster relief; improve the safety of maritime navigation and asset monitoring, and mapping applications in support of the Global Monitoring for Environment and Security (GMES) program, with funding from the European Union.. For more information, please visit: www.mdacorporation.com/corporate/news/pr/pr2011081001.cfm.

12. GMES Initial Operations: Calls for Framework Contracts

GMES (Global Monitoring for Environment and Security) is the European Programme for the establishment of a European capacity for Earth Observation (EO). Several calls have been published recently by the European Commission in the context of the GMES Initial Operations in order to award framework contracts in the following domains: emergency management services, land monitoring services, GMES initial operations. For more information, please visit: http://www.gmes.info/pages-secondaires/news/news-detail/?tx_ttnews%5Btt_news%5D=579&tx_ttnews%5BbackPid%5D=9&cHash=ccdf021879234e2ccb54ec91abc88a11.

13. Sentinel-4: ESA Awards Contract to Build Satellite Sensors

On 11 July 2011, the European Space Agency (ESA) and Astrium Satellites signed a contract to develop and build two satellite sensors that will monitor Earth's atmosphere as part of the Global Monitoring for Environment and Security (GMES) programme. Sentinel-4 will provide data every hour on the chemical composition of the atmosphere. The mission will also serve to improve the monitoring of plumes from volcanic eruptions. For more information, please visit: www.esa.int/esaLP/SEMFSJ9TVPG_LPgmes_0.html.

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